# SULFUR DIOXIDE

Also known as: SO2, sulfurous anhydride, sulfuroxide, sulfurous oxide, sulfurous acid anhydride
Chemical reference number (CAS): 7446-09-5

## What is sulfur dioxide?

Sulfur dioxide, $SO_2$, is a colorless gas or liquid with a strong, choking odor. It is produced from the burning of fossil fuels (coal and oil) and the smelting of mineral ores (aluminum, copper, zinc, lead and iron) that contain sulfur.

Sulfur dioxide dissolves easily in water to form sulfuric acid. Sulfuric acid is a major component of acid rain. Acid rain can damage forests and crops, change the acidity of soils, and make lakes and streams acidic and unsuitable for fish. Sulfur dioxide also contributes to the decay of building materials and paints, including monuments and statues.

## Where is sulfur dioxide found?

Most of the sulfur dioxide released into the environment comes from electric utilities, especially those that burn coal. Some other sources of sulfur dioxide include petroleum refineries, cement manufacturing, paper pulp manufacturing and metal smelting and processing facilities. Locomotives, large ships, and some non-road diesel equipment currently burn high sulfur fuel and release sulfur dioxide into the air. In nature, volcanic eruptions can release sulfur dioxide into the air.

Some dried fruits are preserved using $SO_2$ to prevent discoloration of the fruit. $SO_2$ is also used in bleaching materials and as a fumigant. In the home, sulfur dioxide gas can be found from tobacco smoke, improperly or inadequately vented gas appliances (such as stoves, ranges, furnaces, or clothes dryers), gas or kerosene heaters, wood or coal stoves, or automobile exhaust.

## How can I be exposed to sulfur dioxide?

You can be exposed to $SO_2$ by breathing it in the air or getting it on your skin. People who live near industrial sources of sulfur dioxide may be exposed to it in the air. You are most likely to be exposed if you work in industries where $SO_2$ is produced, such as copper smelting or power plants, or where $SO_2$ is used like the production of sulfuric acid, paper, food preservatives or fertilizers. People with malfunctioning appliances or chimneys in their homes may also be exposed to sulfur dioxide.

## Are there health problems that can be caused by sulfur dioxide?

Although exposure to $SO_2$ has not been shown to cause cancer in humans, there are serious health problems related to both long and short term exposures. Short term exposure to high enough levels of $SO_2$ can be life threatening. Generally, exposures to $SO_2$ cause a burning sensation in the nose and throat. Also, $SO_2$ exposure can cause difficulty breathing, including changes in the body's ability to take a breath or breathe deeply, or take in as much air per breath. Long term exposure to sulfur dioxide can cause changes in lung function and aggravate existing heart disease. Asthmatics may be

sensitive to changes in respiratory effects due to $SO_2$ exposure at even low concentrations.

## How can I reduce my exposure to sulfur dioxide?

To reduce the possibility of exposure to sulfur dioxide caused by a source in your home, you can:

- Use gas appliances with electronic (pilotless) ignition. This will eliminate the continuous low-level pollutants from pilot lights.
- Use exhaust fans over gas stoves that are vented to the outdoors instead of fans that re-circulate the air indoors. Keep the metal mesh filters on your exhaust fans clean (most can be run through the dishwasher).
- Choose vented appliances whenever possible, and make sure they are vented to the outdoors. Have a trained professional inspect your appliances annually.
- Never heat your home with a gas range or stove.
- Do not idle your car in the garage.
- Do not smoke indoors.

Most $SO_2$ exposures are caused by people breathing contaminated outdoor air. Therefore, limit your activities outdoors when you know that air pollution levels are high. The EPA and the Wisconsin Department of Natural Resources (DNR) issue air quality alerts for high pollution days. People with existing respiratory difficulties, like asthma, should pay special attention to these air advisories. Special care should be taken with child asthmatics to limit their outdoor activities during high pollution days.

## For more information

- Wisconsin Poison Control Center, 800-222-1222
- Your local public health department
- Division of Public Health, Bureau of Environmental and Occupational Health, http://dhfs.wi.gov/eh, 1 West Wilson Street, Rm. 150, Madison, WI 53701-2659, (608) 266-1120
- The Agency for Toxic Substances and Disease Registry (ATSDR) Information Center toll-free at 1-888-422-8737 and toxic chemical fact sheets: http://www.atsdr.cdc.gov/tfacts116.html
- USEPA website on sulfur dioxide: http://www.epa.gov/air/urbanair/so2
- New Jersey Department of Health and Senior Services Hazardous Substance Fact Sheet on Sulfur Dioxide: http://www.state.nj.us/health/eoh/rtkweb/1759.pdf

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